-continued

Gln Ser Gly Asn Leu Ala Arg
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<213> ORGANISM: Artificial
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<223> OTHER INFORMATION: human beta-globin gene sequence targeted by the ZFNs

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**1**. A method for treating or preventing viral infection in a subject, the method comprising:

(a) inactivating a gene encoding a viral receptor in an isolated cell using first and second fusion proteins, each fusion protein comprising a zinc finger binding domain engineered to bind to a target site in the gene encoding the viral receptor and a cleavage half-domain, wherein in at least one of the first or second fusion proteins; and

(b) introducing the cell with the inactivated gene encoding the viral receptor into the subject, thereby treating or preventing viral infection in the cell.

**2**. The method of claim **1**, wherein the viral receptor is CCR5 or CXCR4 and the virus is HIV.

**3**. The method of claim **1** wherein the cell is a T-cell.

**4**. The method of claim **3**, wherein the cell is a CD4+ or CD8+ cell.

**5**. The method of claim **1** wherein the cell is a hematopoietic stem cell.

**6**. The method of claim **5**, wherein the cell is a CD34+ cell.

**7**. The method of claim **1**, wherein the cleavage half-domains are Type IIS restriction endonuclease cleavage half-domains.

**8**. The method of claim **7**, wherein the Type IIS restriction endonuclease is FokI.

**9**. The method of claim **1**, wherein the subject is a human.

**10**. A method for treating or preventing hemophilia in a subject, the method comprising:

(a) cleaving a mutant gene encoding a protein product involved in hemophilia in a cell using first and second fusion proteins, each fusion protein comprising a zinc finger binding domain engineered to bind to a target site in the mutant gene and a cleavage half-domain; and

(b) integrating a sequence into the mutant gene that results in a functional copy of the gene, thereby treating or preventing hemophilia in the subject.

**11**. The method of claim **10**, wherein the cell is an isolated stem cell and the method further comprises

(c) introducing the cell into the subject.

**12**. The method of claim **10**, wherein the cleavage half-domains are Type IIS restriction endonuclease cleavage half-domains.

**13**. The method of claim **12**, wherein the Type IIS restriction endonuclease is FokI.

**14**. The method of claim **10**, wherein the subject is a human.

**15**. A method for treating or preventing hemophilia in a subject, the method comprising:

integrating into the genome of a cell a sequence encoding a protein involved in hemophilia using first and second fusion proteins, each fusion protein comprising a zinc finger binding domain engineered to bind to a target site in a gene encoding the viral receptor and a cleavage half-domain such that the protein involved in hemophilia is expressed, thereby treating or preventing hemophilia in the subject.

**16**. The method of claim **15**, wherein the cell is an isolated stem cell and the method further comprises

introducing the cell into the subject.

**17**. The method of claim **15**, wherein the cleavage half-domains are Type IIS restriction endonuclease cleavage half-domains.

**18**. The method of claim **17**, wherein the Type IIS restriction endonuclease is FokI.

**19**. The method of claim **15**, wherein the subject is a human.

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